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ABSTRACT

This report discusses the outcomes of a study of 147 children (ages 7-10) with learning disabilities that investigated the extent to which students legally classified with learning disabilities concurrently manifested mixed lateral dominance (MLD). The study was conducted to determine if MLD was a possible predictive factor for early identification of learning disabilities. The learning disability classification of the subjects included individual performance, verbal, and full-scaled IQ scores. Also included were performance, visual, and Sigma-scaled raw scores. MLD was then measured using the Dennision Laterality Test in all subjects to determine if subjects manifested their perceptual motor or neurological characteristics concurrently with learning disabilities. Results of the study appear to support the heterogeneity of learning disabilities, especially in the pursuit of a simple predictive factor that was significantly associated with early, simple screening and identification of learning disabilities. (Contains 22 references.) (Author/CR)

Mixed Lateral Dominance as a Predictive Factor of Learning Disability.

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ABSTRACT

Mixed Lateral Dominance as a Predictive Factor of Learning Disability.

Characteristics of learning disabilities (LD) have been generalized to academic and language difficulties. The literature, however, was replete with other descriptions including neurological and psychomotor disorders as common characteristics among individuals with LD. This study investigated LD children (n=147) who may have had the proactive potential to be identified by a simple neurological and psychomotor characteristic of mixed lateral dominance (MLD). The purpose of this study, therfore, was to investigate the extent students legally classified with LD concurrantly manifested MLD as a possible predictive factor to yield early formal LD identification. This study appeared to support the heterogeneity of LD in the pursuit of a simple predictive factor that was associated with early identification of this most prevelant handicapping condition in public education.

Mixed Lateral Dominance as a Predictive Factor of Learning Disability.

Characteristics of learning disabilities (LD) have been generalized since the passage of Public Law 94-142 in 1975 (Federal Register, 1977) to academic and language difficulties. Passage of Public Law 101-476 in 1990 (Federal Register, 1991) further heightened the ambiguity surrounding LD by mandating public comment to define "attention deficit disorder" in the law. The literature, however, was replete with other descriptions including neurological and psychomotor disorders as common characteristics among individuals with LD (e.g. Mercer, 1991). Resultantly, rather than assigning etiological or functional characteristics to potential LD learners many teachers preferred to reactively describe their academic behavior.

Although laterality was not truly an academic behavior, its assessment afforded a means by which to identify a neurological or perceptual motor characteristic associated with LD (Whittington & Richards, 1987; Lipson, 1984). Special consideration was directed toward mixed lateral dominance (MLD) given the possible learning and neurological implications of differential hemispheric control and functioning (Hiscock & Kinsbourne, 1980; Edwards, 1979; Ayers, 1973; Orton, 1937) in educational settings. It was not possible to classify LD directly by MLD given that LD cannot be identified by a single criterion (Chalfant, 1985) but perhaps an accurate, reliable, and simple predictive neurological predisposition was present in LD learners. Previous studies (Dempster, 1985; Perfetti & Lesgold, 1977) have found that cognitive performances in learners with LD correlated weakly with academic measures. It was accordingly possible that due to the common practice of waiting for latent academic

behaviors to further disintegrate prior to formal determination of LD in learners that a manifested neurological or perceptual motor characteristic may have been an early identifier of such.

Thus the common practice of assigning LD based on academic behavior may in fact have been an inefficient and reactive educational practice. Another reason for the need for a simpler means for possible LD prediction was the fact that learners with LD were a very hetergeneous group (Fletcher, 1985; McKinney, Short, & Feagan, 1984; Siegel & Linder, 1984). Further, early intervention based on need versus formal classification schema was likely to have been a more positive educational benefit to those learners (Berrueta-Clement et al., 1984; Lazar & Darlington, 1982; Keogh & Glover, 1980).

The majority of the subtyping of poor learners with respect to learning or academic problems has attempted to use prior classification schemes (Chalfant, 1985; Torgeson & Houck, 1980) that were largely complex and reactive in response to learners' needs. They also have traditionally been anchored in local education agency criteria and/or psychometric information. Hence once the learners with LD were identified, they were matched with nondisabled counterparts and compared on various academic or school behavior measures. That practice was viewed by this study as reactive and obviated the proactive as an individually appropriate educational response to learners who possessed LD.

Even though federal regulations governing LD did not include perceptual motor disorders in the evaluation procedures of LD, Cruickshank (1976) maintained that perceptual motor and neurological involvement were key factors in determining LD. The purpose of this study was to investigate the extent learners classified with LD according

to federal regulations concurrantly manifested MLD as a possible simple predictive factor for LD.

METHOD

In an ironic sense, this study employed a reactive examination of LD performance in an attempt to identify a simple proactive means to better predict LD in children prior to their experiencing significant frustration in education (Gickling & Havertape, 1981). Racially and gender diverse subjects classified with LD (n = 147) according to federal regulations by licensed school psychologists served as subjects in the study.

Insert table 1 about here

This LD classification included individual performance (PIQ), verbal (VIQ), and full (FSIQ) scaled IQ scores. Also included were performance (PRS), visual (VRS), and Sigma (SRS) scaled raw scores. MLD (i.e. eye, hand, and foot) was then measured using the Dennision Laterality Test (1981) in all subjects to determine if subjects manifested this perceptual motor or neurological characteristic concurrently with LD.

In this study of a practical prediction problem for LD, MLD served as the independent predictor variable for the dependent variables of LD (i.e. PIQ, VIQ, FSIQ, VRS, PRS, and SRS). It was determined that this design (Kirk, 1982) would best represent the realistic parameters of LD in a multidimensional perspective commonly associated with the evaluation of such as well as reduce the standard error of

measurement.

RESULTS

Results obtained retained the null hypothesis at the $p>.05$ level of significance for R SQUARED (.03863) with the coefficient of determination corrected for degrees of freedom (-.00257) and the Durbin-Watson statistic (1.8552) rejected to avoid autocorrelation. The additional statistical treatments for multiple regression as well as ANOVA (**F** = .9376) were included to minimize possible TYPE I errors due to the hetergeneity of the LD population.

Insert tables 2 and 3 about here

DISCUSSION

This study appeared to support the heterogeneity of LD especially in the pursuit of a simple predictive factor that was significantly associated with early, simple screening and identification of this most prevelant school aged handicapping condition. Regrettably this study supported the existing knowledge base of LD with respect to the common practice of viewing this disability in a behavioral as opposed to a characteristic based manner of early diagnosis. The contribution of this study, however, was nested in the continued scholarly inquiry necessary to identify an efficient and effective predictive characteristic for LD.

Its primary relevence was in possibly eliminating yet another characteristic that

need not be investigated by researchers with replicate this study's findings. The perlexing identification, classification, and educational treatment of LD in addition to the mandated quest to define attention deficit disorder is likely to continue and confound teachers and learners alike. To exclude inquiry for simpler referral or indentification of LD would be a disservice to not only educators, but more importantly to learners themselves.

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Table 1. Demographics of LD subjects.

Demographic	N	Sum	%	X	R
Age	147			8.27	7-10
MLD	60	147	41		
Non-MLD	87	147	59		
Males	102	147	69		
Females	45	147	31		
Black	**73**	**147**	**50**		
male	55	73	75		
female	18	73	25		
Caucasian	**68**	**147**	**46**		
male	44	68	65		
female	24	68	35		
Hispanic	**06**	**147**	**04**		
male	03	06	50		
female	03	06	50		

Table 2. Multiple regression of MLD as prediction of LD.

Factor	**B**	**SEB**	**t**
Constant	2.112	1.4048	1.5035
PIQ	-.0422	.0333	-1.2783
VIQ	-.0347	.0297	-1.1708
FSIQ	.4846	.0496	.9764
PRS	.0075	.0234	.3193
VRS	.0070	.0070	.9999
SRS	.0065	.0110	.5914

Note. Standard Error of Estimate (**SEB**) = .487

Coefficient of Determination (**R**) = .038

Coefficient of Multiple Correlation (**R2**) = .196

Corrected Coefficient of Determination (**R2a**) = -.002

Durbin-Watson Statistic = 1.855

Table 3. ANOVA table for MLD as a prediction for LD.

Variation (a)	**SS**	**DF**	**MS**
SSR	1.339	6	.223
SSE	33.327	140	.238
SST	34.666	146	

Note. (a) **F** ratio 6/140 = .9376

Critical **F** value p>.05 = 2.10

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